

PREVALENCE OF COVID-19-LIKE SYMPTOMS IN ITALY AND LOMBARDY, MARCH-APRIL 2020, AND THEIR IMPLICATIONS ON CANCER PREVENTION, DIAGNOSIS AND MANAGEMENT

Short title: Prevalence of COVID19-like symptoms in Italy

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Abstract

Two population-based surveys on COVID-19 like symptoms were conducted by BVA-Doxa on representative samples of the general population from Italy and its largest region, Lombardy, with over 10 million inhabitants and heavily struck by COVID19, on March 27-30 and April 3-7, on a total of 2000 individuals – 353 from Lombardy. Overall, 14.2% of Italians – and 19.6% in Lombardy – reported COVID-19-like symptoms. The estimated prevalence was higher in the young, in smokers, and in Lombardy over the period 20 March to 7 April. Although the influenza season was ended by mid-March, at least part of the symptoms may be not COVID-19 related. Even assuming that only half are, at least 7% of Italians and 10% in Lombardy had been affected by COVID-19. To these, asymptomatic or pauci-symptomatic cases have to be added. These estimates are at least one or two order of magnitude larger than official registered cases. This has major implications for cancer prevention, management and treatment.

Key words.

COVID-19; prevalence; cancer prevention; cancer treatment.

Several thousand COVID-19 infected patients were projected in Italy by mid-March (Remuzzi and Remuzzi, 2020), and registered COVID-19 cases were over 110,000 by the end of March (Boccia *et al.*, 2020).

Italy, and its largest region, Lombardy (with 10 million inhabitants), have been also subsequently heavily hit by the COVID-19 epidemic. According to official data (Protezione Civile, 2020), up to 21 April 183,857 cases and 24,648 deaths were registered in Italy. Corresponding figures for Lombardy were over 67,931 cases and over 12,579 deaths.

The COVID pandemic has substantial health implications besides its direct effects on population morbidity and mortality (Rosenbaum, 2020). Cancer screening, diagnosis and management have been heavily affected by the current pandemic, and it is therefore important to provide figures on COVID cases and deaths, in order to provide a perspective for the evolution of the pandemic and its potential implications on cancer patients (Nelson, 2020; Vrdoljak E *et al.*, 2020). Each year, in Italy, about 180,000 cancer deaths are registered, corresponding to over 350,000 incident and 2 million prevalent cases (Santucci C *et al.*, 2020). These figures have to be put in perspective with the current COVID cases, deaths and hospital burden.

The real number of COVID cases is however undefined, and in Italy registered cases include essentially hospital admissions, plus a small number of positive subjects from non-organized PCR tampons.

To obtain an estimate of possible number of cases, we included a series of questions on COVID-19 related symptoms (including fever, headache, cold, cough, gastrointestinal disorders -plus, separately, fever over 38.5 degrees Celsius), in two weekly national survey routinely conducted by BVA-Doxa. The first survey was conducted on March 27-30, and based on a sample of 1000 individuals, representative of the general Italian population aged 18-85 in terms of sex, age, geographic area and socio-economic status. Of these, 169 subjects were resident in Lombardy. The second survey, was conducted on April 3 to 7, using a different sample identified with the same criteria also included 1000 subjects, 184 from Lombardy. Thus, the two waves combined cover the period 20 March to 7 April. The data were collected using computer assisted web interviews (CAWI), and related to the three weeks preceding data collection. Confidence intervals of percentage estimates were based on the binomial distribution. We also computed the odds ratios (OR), and the corresponding 95% confidence intervals (CI) of reporting

COVID-19 like symptoms, including terms for sex, age, smoking, education, wave of interview, and area of residence.

The key findings are given in the Table 1. In Italy, 14.2% of subjects reported some COVID-19-like symptoms, and 1.3% fever over 38.5 degrees over the last 2 weeks. Corresponding figures for Lombardy were 19.6% for any symptom, and 2.3% for fever over 38.5 degrees Celsius. Both in Italy and in Lombardy, the proportion of subjects reporting COVID-19-like symptoms was higher in women than in men, at younger age than in middle age and the elderly, in smokers than in nonsmokers, and in subjects with higher education. For age and smoking, the differences were significant.

Table 2 gives the corresponding multivariate ORs. These were 2.0 (95% CI 1.5-2.8) for the young vs the elderly, 1.6 (95% CI 1.2-2.1) for smokers vs nonsmokers, and 1.7 (95% CI 1.2-2.3) for Lombardy vs other Italian regions.

At least part of the symptoms reported are not COVID-19 related. Although the annual flu season had ended by mid-March – and was particularly moderate the last winter - , part of the symptoms reported may well be related to other, non-specific (viral) conditions. It is possible, however, that a considerable proportion of symptoms – and most of fever over 38.5 degrees in March and early April – were due to COVID-19. Even assuming that only about half of reported symptoms were due to COVID-19, over 7% of the population in Italy and 10% in Lombardy would have been affected by COVID-19 in the weeks covered by data collection only. This would correspond to at least 5 million subjects affected in Italy, and 1 million in Lombardy alone, a figure that can be doubled assuming that most COVID-19-like symptoms are indeed COVID-19 related. The information was restricted to a 2-week period, and additional subjects likely had been affected before 20 March. In addition, an undefined proportion of the population has been affected by totally or minimally symptomatic, COVID-19, and were not reported in our survey.

While the key limitation of the survey is its subjective, self-reporting of symptoms, it has the strength of being included in a routinely weekly conducted, validated survey, of being reasonably large, and representative of the general population of Italy and Lombardy.

The larger proportion of symptoms at younger age likely reflects more active social interactions in this age group.

These data indicate therefore that – even ignoring asymptomatic cases – the COVID-19 epidemic may well have affected a substantial proportion of the Italian population by early April, certainly at least one order of magnitude larger, and possibly up to two order of magnitude larger, than the registered cases.

Still, these estimates remain far from those required to reach adequate natural immunity on a population level, and indicate therefore that the COVID pandemic is going to persist in Italy at least for the next couple of months.

This would, therefore, imply unique challenges to the diagnosis and management of other diseases, including cancer.

ACCEPTED

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Table 1

Prevalence (%) and 95% confidence intervals of Covid19-like symptoms in the last three weeks in a representative sample of the Italian population. BVA-Doxa, Italian national surveys, 27-30 March and 3- 7 April 2020.

	Italy (N,%) N=2000		Lombardy (%) N=353	
	N (yes/no)	% Yes	N (yes/no)	% Yes
Covid19-like symptoms	283/1717	14.2 (12.6-15.7)	69/284	19.6 (12.8-25.0)-
Fever >38.5°C	26/1974	1.3 (0.8-1.8)	8/345	2.3 (0.9-4.42)
Any symptom by strata				
Sex				
Men	133/828	13.8	30/142	17.4
Women	150/889	14.4	39/142	21.6
	p=0.70		p=0.33	
Age				
18-44	148/624	19.2	40/91	30.5
45-64	79/610	11.5	15/115	11.5
65-85	56/483	10.4	14/78	15.2
	p-trend<0.0001		p-trend=0.0017	
Smoking				
No	172/1218	12.4	41/210	16.3
Yes	111/499	18.2	28/74	27.5
	p=0.0006		p=0.02	
Educational level				
Middle school or less	36/231	13.5	6/40	13.0
High school	135/894	13.1	37/150	19.8
University	112/592	15.9	26/94	21.7
	p-trend=0.17		p-trend=0.25	
Wave of interview				
27-31 March	144/856	14.4	31/138	18.3
3-7 April	139/861	13.9	38/146	20.7
	P=0.75		P=0.59	

Table 2

Prevalence odds ratio and 95% confidence intervals of COVID-19-like symptoms in the last three weeks in a representative sample of the Italian population. BVA-Doxa, Italian national surveys 27-30 March and 3-7 April 2020.

	OR^a (95% CI)
Sex	
Men	1 (ref)
Women	1.03 (0.80-1.34)
Age	
18-44	2.02 (1.45-2.82)
45-64	1.10 (0.76-1.59)
65-85	1 (ref)
Smoking	
No	1 (ref)
Yes	1.62 (1.24-2.11)
Educational level	
Middle school or less	1 (ref)
High school	0.97 (0.65-1.44)
University	1.17 (0.77-1.77)
Wave of interview	
27-31 March	1 (ref)
3-7 April	0.94 (0.73-1.21)
Area of residence	
Lombardy	1.7 (1.24-2.28)
Other	1 (ref)

^a Estimated from a logistic model including all the terms above.